



PATENT
2342-0107P

IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicant: Mitsuhiro HIRANO Conf.: 3165
Appl. No.: 03/313,200 Group: 2814
Filed: March 7, 1997 Examiner: S. Rao
For: SUBSTRATE PROCESSING APPARATUS WITH
LOCAL EXHAUST FOR REMOVING CONTAMINANTS

LARGE ENTITY TRANSMITTAL FORM

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

August 11, 2003

Sir:

Transmitted herewith is a Reply in the above-identified application.

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INDEPENDENT	4	-	4	=	0	\$ 84	\$0.00
<input type="checkbox"/> FIRST PRESENTATION OF A MULTIPLE DEPENDENT CLAIM						\$280	\$0.00
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- Petition for one (1) month(s) extension of time pursuant to 37 C.F.R. §§ 1.17 and 1.136(a). \$110.00 for the extension of time.
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Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

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Attachment(s)

EW 14-11

PATENT
2342-0107P



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Mitsuhiro HIRANO Conf. No.: 3165
Appl. No.: 03/813,200 Group: 2814
Filed: March 7, 1997 Examiner: S. Rao
For: SUBSTRATE PROCESSING APPARATUS WITH LOCAL EXHAUST
FOR REMOVING CONTAMINANTS

REPLY UNDER 37 C.F.R. 1.116

Honorable Commissioner for Patents
Washington, D.C. 20231

August 11, 2003

Sir:

In response to the Office Action of April 10, 2003, the due date having been extended one (1) month, please consider a Request for Reconsideration as follows:

Remarks/Arguments begin on page 2 of this paper.

REMARKS/ARGUMENTS

REPLY TO REJECTIONS

First Rejection

Claims 10, 11, 16 and 18 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,273,423 to Shiraiwa (hereafter Shiraiwa), U.S. Patent No. 5,277,215 to Yanagawa et al. (hereafter Yanagawa), and U.S. Patent No. 5,223,001 to Saeki (hereafter Saeki). This rejection is traversed.

It is noted that in the rejection, the Examiner has incorporated his previous rejection. Certain phrases are not applicable. For example in Saeki it was stated to be "newly added". This is clearly incorrect and the Patent Office may wish to review the rejection for accuracy.

With regards to Shiraiwa, the Office Action only asserts that Shiraiwa teaches a substrate processing apparatus as previously stated. However, the Office Action has failed to address applicant's two previous arguments regarding Shiraiwa. For example, as previously noted, applicant submits that element #32 in Fig. 2 of Shiraiwa is not a local exhaust for locally exhausting a dust generating portion of the moving mechanism as asserted by the Examiner in the Office Action.

Instead, element #32 is a chamber exhaust for exhausting the load lock chamber. The Examiner has described element #32 of Shiraiwa as both the local exhaust and the chamber exhaust. However, Shiraiwa only discloses the exhaust tube 32 for exhausting the load lock chamber 8. Shiraiwa fails to disclose or suggest local exhaust for locally exhausting a dust generating portion of a moving mechanism.

In contrast to Shiraiwa, the present invention in the context claimed, includes a local exhaust for locally exhausting a dust generating portion of a moving mechanism disposed in a load lock chamber, in addition to a chamber exhaust for exhausting the load lock chamber, as set forth in claims 10, 11, 16 and 18. Based on previous statement made by the Examiner, it appears that the Examiner may be mistakenly associating 121, 120 and 122 in Fig. 2 of the present application with both local and chamber exhaust. However, none of 121, 120 and 122 includes a local exhaust. In the present embodiment, the local exhausts are 20, 21 and 22.

Furthermore, Shiraiwa discloses that the element 32b is not the local exhaust for locally exhausting the dust generating portion of the moving mechanism provided in the load lock chamber. The element 32b in Shiraiwa is used only when the cassette chamber 61 is exhausted. (see Shiraiwa, col. 5, lines 49-66). The valve of the gas exhaust tube 32b is open only when the vacuum is created inside the cassette chamber 61. After that, the valve of the gas exhaust tube 32b is closed and the N₂ gas is introduced into the cassette chamber 61. Then the gate between the cassette chamber 61 and the transfer chamber 60, and between the load lock chamber 8 and the transfer chamber 60 are opened to transfer the wafer cassette 63 to the wafer boat 13 in the load lock chamber 8. That is, the gas exhaust tube 32b is never used to locally exhaust the dust generating portion of the moving mechanism provided in the load lock chamber 8.

The Office Action has relied on Shiraiwa to teach the local exhaust feature and the other cited references fail to cure the inherent deficiencies of a rejection based on Shiraiwa. As such, applicant respectfully submits that at least for this reason, Shiraiwa and the other cited references fail to make claims 10, 11,

16 and 18 obvious.

Also, in the rejection, the Examiner has failed to discuss the rejection as to claims 16 and 18. This failure amounts to a "phantom rejection" of these claims which is improper.

For the reasons set forth, the Examiner is requested to reconsider and withdraw the rejection under 35 U.S.C. 103.

Second Rejection

Claims 16 and 18 were rejected under 35 U.S.C. 103(a) as being unpatentable over Shiraiwa, Yanagawa, and U.S. Patent 5,324,540 to Terada (hereinafter Terada).

Concerning claims 16 and 18, the Office Action again asserts that Shiraiwa teaches a substrate processing chamber as previously stated and the Office Action ignores applicant's previous arguments concerning Shiraiwa.

The apparatus according to claim 16 of the present application comprises a second vacuum exhaust line, which is connected with the substrate processing chamber and the first vacuum exhaust line. A third vacuum exhaust line is connected with the load lock chamber, and the first vacuum exhaust line is to be connected to a vacuum pump. The first vacuum exhaust line is connected with the load lock chamber and a second vacuum exhaust line is connected with the substrate processing chamber and the first vacuum exhaust line. Shiraiwa fails to teach or suggest this structure. With the claimed structure, manufacturing cost can be lowered and the entire system can be simplified. (see applicant's specification, page 12, line 27 to page 13, line 5).

Furthermore, the apparatus according to claim 16 further comprises a second valve provided at a portion of the first vacuum exhaust line between the load lock chamber and a connection portion

of the first and second vacuum exhaust line. A valve controller controls the first and second valves. The valve controller controls the second valve to be closed during processing of the substrate in the substrate processing chamber.

For example, in a reaction oven 19, a film formation processing of the wafer 101 is carried out. As conditions of such a film formation, it is important to strictly control the temperature and pressure within the reaction oven 19. (see applicant's specification, page 19, line 6 to page 20, line 6).

In the present embodiment, N₂ ballast method is employed as a method for pressure control. The N₂ ballast method is a method in which the gas-exhausting is conducted while keeping an exhaust capability of the vacuum pump 80 constant, allowing N₂ gas to enter from the N₂ ballast piping 131 which is connected to an intermediate portion of the vacuum exhaust line 122. The flow rate of the N₂ gas is controlled by the flow meter 132, thereby adjusting the exhaust amount from the reaction oven 19 to adjust the pressure in the reaction oven 19.

In this manner, the pressure within the reaction oven 19 is strictly adjusted by adjusting the exhausting capability from the reaction oven 19 by the vacuum exhaust line 122. Therefore, during formation of film within the reaction oven 19, if the exhaust gas from the local exhaust line 23 is left flowing into the vacuum exhaust line, a variation in the flow rate of the local exhaust line 23 and the like affects the vacuum exhaust line 122 to vary the exhaust conductance of the vacuum exhaust line 122. As a result, pressure within the reaction oven 19 is varied. Therefore, the local gas-exhausting is not conducted during the film formation processing in the reaction oven 19.

On the other hand, if the local gas-exhausting is stopped as

described above, because the wafers 101 and the boat 10 exist within the reaction oven 19, such wafers 101 and the boat 10 are not contaminated.

The Examiner asserts that element 61 of Shiraiwa is a processing chamber. However, 61 is not a processing chamber, 61 is a cassette chamber. Furthermore, in the present invention, it is not a processing chamber to which the local exhaust is connected, it is a space covered by a cover for covering a dust generating portion of the moving mechanism to which the local exhaust is connected.

In claim 16, the second exhaust line is connected to the first exhaust line which is to be connected to the vacuum pump, which connection necessarily means that the first and second exhaust lines are necessarily connected to a single vacuum pump.

As for claim 18, Shiraiwa's Fig. 11 element #18 top covering of the wafer boat or #26 flange is not a cover for covering a dust generating portion of the moving mechanism. Further, Shiraiwa fails to disclose the claimed partition, and also fails to disclose the claimed gas flow through the slit in the partition.

As for the Terada reference, the boat supporting and rotating system 20 is provided out of the inner cylinder 6 and not in the inner cylinder 6. That is, a dust generating portion is not in the inner cylinder 6, which forms a processing region 8 for processing wafers. Further, as apparent from Fig. 3 of Shiraiwa, and its explanation, the exhaustion of the boat supporting and rotating system 20 and the exhaustion of the inner cylinder 6 are not performed simultaneously. That is, when the process tube is exhausted, the valve V5 is closed, and therefore, Terada also fails to disclose the main structure of the apparatus according to claim 18.

Applicant respectfully submits that the combination of cited references fail to teach or suggest each and every feature as set forth in the claimed invention, for at least the reasons noted above.

Accordingly, reconsideration and withdrawal of the rejection of claims 16 and 18 is requested.

REPLY TO RESPONSE TO ARGUMENTS

In the paragraph bridging pages 4-6 of the Office Action, the Examiner sets forth arguments with respect to the rejections of claims 10, 11 and 18. The Examiner did identify in the first part of the Office Action, that only the previous rejection was being repeated and, apparently the response to arguments were used in an effort to fortify the Examiner's position regarding obviousness.

Initially, in rejecting the claims on Shiraiwa and the two references, the Examiner asserts in the rejection that the atmospheric pressure vent line being connected to the vacuum exhaust line is shown in Figures 36 and 38 of Yanagawa. The rejection fails to identify what portion other than Figures 36 and 38 the Examiner is relying on. That is, what is the Examiner's intention regarding the assertion of an atmospheric pressure vent line being connected to the vacuum exhaust line.

Furthermore, the Examiner then states it would have been obviously substitute in Yanagawa's atmospheric pressure vent line (not identified) instead of Shiraiwa in Shirawa's [sic apparatus to exhaust the chamber.] This comment is not clear. Apparently, there is a typing error. Also, this statement is purely speculation and is not sufficient evidence as required by the law. See, *In re Kotzab* (CAFC), 55 USPQ 2nd, 1313 (June 2000), wherein the Court stated in part as follows:

The ultimate determination of whether an invention would have been obvious under 35 U.S.C. (103)(a) is a legal conclusion based on underlying findings of fact. See, *Dembiczak*, 175 Fed. 3rd at 998, 50 USPQ 2nd at 1616. We reviewed the Board's ultimate determination of obviousness *de novo*. See *id.* However, we reviewed the Board's factual findings for substantial evidence. See *In re Gartside*, 213 F. 3d 1305, 1316, 53 USPQ 2nd, 1769, 1776 (Fed. Cir. 2000).

Substantial evidence is something less than the weight of evidence, but more than a mere scintilla of evidence.

Based on the above-mentioned case, the evidence presented is insufficient and does not support a *prima facie* case of obviousness.

Also, in commenting on claim 11, the Examiner refers to figure 1 of Yanagawa and column 1, lines 21-24. Actually, column 1, lines 21-24 are directed to figure 19. Accordingly, the Examiner's reliance on figure 1 in this context is not understood.

In the second rejection, Terada was asserted to show a cover in the context claimed. This has not been identified in the Office Action. Also, in the response to arguments, it was asserted that elements 18 and 26 are Shiraiwa were the covers. This appears to be in conflict with the rejection. Also, element 18 does not perform the function in the context claimed.

The Examiner also refers to identifying element 32d at an interview. There is no record in writing of this. See, 37 C.F.R. 1.2.

While the Office Action maintains that element 32d of Shirawa is a local exhaust for exhausting dust, element 32d permits N2 gas to escape into the plant exhaust. The purpose of this is to hold the N2 at a normal pressure. See, for example, column 5, lines 20-31. Furthermore, there is absolutely no disclosure, either specifically or inherently that the claimed local exhaust for locally exhausting "a dust generating portion of said moving mechanism" is disclosed or suggested in the reference.

In the response to arguments, it was the Examiner's position that the Applicants have argued the reference separately. They have only provided a peace meal analysis. What has been done in the rejection is to point out what has been lacking in each of the references so that even if they could be combined, the structure that is claimed is not shown or suggested by the combination of references.

It appears what the Examiner has done, is merely selected bits and pieces of the reference to apply a rejection, which concept is improper. See, *In re Wesslau*, 147 USPQ 391 (CCPA 1965) wherein the Court stated as follows:

It is impermissible within the framework of section 103 to pick and choose from any one reference, only so much of it as will support a given position, to the exclusion of the other parts necessary to the full appreciation of what such references fairly suggest to one of ordinary skill in the art.

Also, it appears that the Examiner has fallen into the of impermissible hindsight. See, *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 231, USPQ 81, 93 (Fed. Cir. 1996) wherein the Court stated as follows:

Focusing on the obviousness of substitutions and differences instead of the invention as a whole. . . was a legally improper way to simplify the difficult determination of obviousness.

In summation, the rejection fails to establish a *prima facie* because (1) outside of the Applicants own disclosure, there would be no legal motivation reason to combine the references or (2) even combining the references, the structure that has been set forth in the claims, is not shown or suggested by the references.

CONCLUSION

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact Elliot Goldberg at (703) 205-8000.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicant(s) respectfully petition(s) for a one (1) month extension of time for filing a reply in connection with the present application, and the required fee of §§110.00 is attached hereto.

Docket No.: 2342-0107P
App. No.: 08/813,200

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment from or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §1.16 or under 37 C.F.R. §1.17; particularly, the extension of time fees.

Respectfully submitted,

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